AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended): A dispersion slope equalizer for compensating signal distortion caused by dispersion slope of a transmission line when transmitting lightwaves with plural wavelength signals in the transmission line characterized by comprising:

N (N: natural number) waveguides, N output wavelength demultiplexer and/or N input wavelength multiplexer, and K (K: natural number, K < N) group delay controllers;

said N waveguides being connected to outputs of said wavelength demultiplexer and/or inputs of said wavelength multiplexer;

in said group delay controllers, one or both of input/output parts of lattice-form optical circuits being set on said N waveguides;

wherein said lattice-form optical circuits are composed of two waveguides interleaved with at least two directional couplers, and said two waveguides are designed so that optical path lengths between said directional couplers are different;

wherein control parts of waveguide refractive index for effecting phase control of said waveguides are provided between respective ones of said directional couplers and in respective ones of said directional couplers, and semipermanent phase shift is achieved by applying local heating and quenching for a photoelastic effect to said control parts of waveguide refractive index.

Claim 2 (Original): The dispersion slope equalizer as claimed in Claim 1, wherein said wavelength demultiplexer and said wavelength multiplexer are arrayed-waveguide gratings.

Claim 3 (Original): The dispersion slope equalizer as claimed in Claim 1, wherein said group delay controllers are connected to N input wavelength multiplexer and said N waveguides are connected to only inputs of said wavelength multiplexer.

Claim 4 (Original): The dispersion slope equalizer as claimed in Claim 3, wherein said wavelength multiplexer is an arrayed-waveguide grating.

Claim 5 (Original): The dispersion slope equalizer as claimed in Claim 1, wherein said group delay controllers are connected to N output wavelength demultiplexer and said N waveguides are connected to only outputs of said wavelength demultiplexer.

Claim 6 (Original): The dispersion slope equalizer as claimed in Claim 5, wherein said wavelength demultiplexer is an arrayed-waveguide grating.

Claim 7 (Withdrawn): The dispersion slope equalizer as claimed in Claim 1, wherein said group delay controllers are composed of the combination of the lattice-form and transversal-form optical circuits.

Claim 8 (Withdrawn): A dispersion slope equalizer for compensating signal distortion caused by dispersion slope of a transmission line when transmitting lightwaves with plural wavelength signals in the transmission line characterized by comprising:

N (N: natural number) waveguides, N output wavelength demultiplexer and/or N input wavelength multiplexer, and N group delay controllers;

said N waveguides being connected to outputs of said wavelength demultiplexer and/or inputs of said wavelength multiplexer;

in said group delay controllers, one of inputs and an output of transversal-form optical circuits being set on said N optical waveguides;

wherein the transversal-form optical circuit is provided with first waveguide for one of inputs and M (M: natural number, $M \geq 2$) directional couplers for coupling M waveguides with

said first waveguide at M different positions, and said M waveguides, after being coupled with said first waveguide, are multiplexed by a multiplexer into a second output waveguide.

Claim 9 (Withdrawn): The dispersion slope equalizer as claimed in Claim 8, wherein said wavelength demultiplexer and said wavelength multiplexer are arrayed-waveguide gratings.

Claim 10 (Withdrawn): The dispersion slope equalizer as claimed in Claim 8, wherein said group delay controllers are connected to N input wavelength multiplexer and said N waveguides are connected to only inputs of said wavelength multiplexer.

Claim 11 (Withdrawn): The dispersion slope equalizer as claimed in Claim 10, wherein said wavelength multiplexer is an arrayed-waveguide grating.

Claim 12 (Withdrawn): The dispersion slope equalizer as claimed in Claim 8, wherein said group delay controllers are connected to N output wavelength demultiplexer and said N waveguides are connected to only outputs of said wavelength demultiplexer.

Claim 13 (Withdrawn): The dispersion slope equalizer as claimed in Claim 12, wherein said wavelength demultiplexer is an arrayed-waveguide grating.

Claim 14 (Withdrawn): The dispersion slope equalizer as claimed in Claim 8, wherein said group delay controllers are composed of the combination of the combination of the transversal-form and lattice-form optical circuits.

Claim 15 (Currently Amended): A dispersion slope equalizer for compensating signal distortion caused by dispersion slope of a transmission line when transmitting lightwaves with plural wavelength signals in the transmission line comprising:

N (N: natural number) waveguides;

at least one of an N output wavelength demultiplexer or an N input wavelength multiplexer, wherein said N waveguides are coupled to at least one of one or more outputs of said wavelength demultiplexer or one or more inputs of said wavelength multiplexer; and

K (K: natural number, K < N) group delay controllers comprising lattice-form optical circuits, wherein at least one of an input part or an output part of said lattice-form optical circuits are connected to said N waveguides;

wherein said lattice-form optical circuits comprise at least two waveguides interleaved with at least two directional couplers, and said at least two waveguides have different optical path lengths between said at least two directional couplers;

wherein control parts of waveguide refractive index for effecting phase control of said waveguides are provided between respective ones of said directional couplers, or between respective ones of said directional couplers and in respective ones of said directional couplers, and semipermanent phase shift is achieved by applying local heating and quenching for photoelastic effect to said control parts of waveguide refractive index.

Claim 16 (Previously Presented): The dispersion slope equalizer of Claim 15, wherein said at least one of said wavelength demultiplexer or said wavelength multiplexer comprises arrayed-waveguide gratings.

Claim 17 (Previously Presented): The dispersion slope equalizer of Claim 15, wherein said group delay controllers are connected to said wavelength multiplexer, and said N waveguides are connected to said input part of said wavelength multiplexer.

Claim 18 (Previously Presented): The dispersion slope equalizer of Claim 17, wherein said wavelength multiplexer comprises an arrayed-waveguide grating.

Claim 19 (Previously Presented): The dispersion slope equalizer of Claim 15, wherein said group delay controllers are connected to said output wavelength demultiplexer, and said N waveguides are connected to said output part of said wavelength demultiplexer.

Claim 20 (Previously Presented): The dispersion slope equalizer of Claim 19, wherein said at least one wavelength demultiplexer comprises an arrayed-waveguide grating.